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ABSTRACT

The Voyage of MIMI is a major educational project housed at Bank Street College (New York) which is directed toward the development of extensive television, computer software, videodisc, and print materials for use in science and mathematics education in grades 5-7. The first series has been completed, and includes a 13-part dramatic television series about a scientific investigation of whaling on the East Coast on a ship called the MIMI. In the series, research scientists and a crew of students note patterns of whale migration using a number of scientific approaches, and encounter a number of exciting adventures. In addition, there are 13 television documentary-style visits to different "real" scientific establishments. These television materials are accompanied by a teacher's guide, a book describing the television series, and four computer programs. The computer programs include simulations of ecosystem development and population growth patterns, a navigation game, and computer-based tools for measurement experiments. Evaluations of the first series indicated that: (1) the dramatic story presented in the television series served as an excellent motivator for students in the areas of science and mathematics, and a number of the characters provided excellent role models; (2) teachers found the materials both exciting and innovative, but somewhat difficult to fit into their traditional classroom concepts; and (3) the production of the materials was extremely expensive, resulting in large uncertainties about available funding and the omission of some intended developments. (EW)

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The Voyage of the MIMI

Sam Gibbon with Kristina Hooper

IR 013547

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Saul Rockman

Sam's presentation at the Conference was direct and clear. I have summarized the basic issues Sam raised, and I have then commented on the implications of each of these. As a member of the Voyage of the Mimi advisory committee, I have tried to make explicit some of the reasoning behind different design approaches so that they are made obvious. Not so clearly, my comments reflect my own opinions, but the hope is that juxtaposed with the basic description of this project they will provide the reader with a sensible approach to Sam's perspective, much of which currently is reflected in the Voyage of the Mimi project at Bank Street College.
(kh)

General Description of the Project

The Voyage of the MIMI is a major educational project housed at Bank Street College, in New York City. It is directed toward the development of extensive television, computer software, videodisc, and print materials for use in science and mathematics education for students in grades 5-7.

Bank Street College provides an excellent setting for this kind of innovative program. It is one of the few academic institutions with the technological and video sophistication required for an effort on this scale, and it also has an in-house elementary school, an in-house teacher training facility, and the talent to do extensive testing of new materials.

This project is funded by the Department of Education; materials are distributed through Holt, Rinehart, and Winston Publishers.

This project arose as a response to a Request for Proposal (RFP) from the Department of Education in 1982 to combine a range of media—particularly TV, videodisc, and computer software—in the teaching of science and mathematics. This RFP was crucial historically in focusing national attention on the potential of this multimedia approach, as well as indicating a commitment at a national level to fund such a large scale project.

The first series of the Voyage of the MIMI has been completed and has been available to schools for the last year. The materials include a 13-part dramatic TV series, which portrays a scientific investigation of whaling on the East Coast on a ship called the *MIMI*; in this series, research scientists and a very young crew note patterns of whale migration, using a number of scientific approaches, and they encounter a number of exciting adventures. In addition, there are 13 TV documentary-style visits to different "real" scientific establishments, which complement this dramatic series (using some of the dramatic series actors as hosts).

These TV materials are accompanied by a teacher guide as well as a book that describes the TV series. There are also four computer programs that complement the TV series, providing students with hands-on experience with the topics investigated by the MIMI scientists.

The integration of these materials happens in the classroom and in the students' minds. It is not a technological integration, then, but the combination of a range of single-purpose media, each of which enhances the others. Central to this project is the TV dramatic series; it focuses kids' attention on the excitement of "doing science" and on the people involved in this endeavor. Sam's excellent talents in storytelling on TV for children are then put to very good use; the stories lay out the basic principles and provide motivation for students to pursue different topics in the other materials.

The TV documentaries extend the notion of "hands-on science," showing how people work in the world on a range of related topics. Making good use of the characters established in the dramatic series—particularly a young boy named CT, who is about the same age as the student audience—these documentaries help students see how science might be relevant to their lives, and possibly a focus for their own development.

The computer software for this project is designed to work like that used in the scientific community. One module focuses on ecosystem development and population growth patterns; it is based on similar simulations used by scientists. A navigation game provides students with experiences not unlike those of a ship's captain, engaging computational and mathematics reasoning skills. A set of computer-based tools let the young student try out a range of measurement experiments tried in the dramatic series, as well as extend experiments beyond this context.

A second series—*Voyage of the MIMI II*—is currently in production. It extends the route of the *MIMI* to the Yucatán to investigate Mayan ruins. This series also focuses on mathematics and science, though the scientific context is anthropology rather than marine biology.

Lessons Learned: The Story

The project team and students learned a number of things from the production of the first *Voyage of the MIMI* series.

For one, the project team learned that the dramatic story had an immense value to students. It served as an excellent motivator for introducing students to mathematics and science, areas that are typically of little interest to most students. In addition, a number of the characters served as excellent role models for the students, making it clear to many of them that these topics were well within their own reach.

Students also indicated an appreciation of science and human values after experience with the program materials, seeing how the "dull and dry" pursuit of science is actually quite lively and human oriented.

It seemed, then, that these materials served a viable role in letting scientific and mathematical information be housed in a credible context that could be brought into the classroom.

Most of these outcomes were not simply "happy coincidences," but represented the successful implementation of design strategies brought to the project. For example, the characters in the drama were carefully chosen and consciously developed as approachable to the students as well as compelling in the drama. The choice of a woman scientist to head the expedition and a Chicano to be her main assistant helped set the tone of this scientific investigation; stodgy stereotypes and white lab jackets were left on shore. The inclusion in the young crew of a Black boy from New York City as well as an affluent female suburbanite also extended students' ability to relate to the presentation and to move beyond expected stereotypes. The deaf crew member made the day-to-day aspect of this handicap as well as topics related to sound transmission easily approachable and understandable. And, the choice of an endearing boy about the age of the students, who was the grandson of the MIMI's captain, brought notions of family conflicts directly into the show.

The choice of whales as the topic of investigation also enhanced student engagement in the series, of both girls and boys. Similarly, the adventure stories—including a classic shipwreck and test of survival—added to student involvement with the story.

Lessons Learned: Teacher Response

Teachers have had a range of responses to the materials, finding them both exciting and innovative as well as somewhat difficult to fit into their traditional classroom contexts. Some of the teachers have had difficulty dealing with the emotions raised by the stories portrayed in the dramatic episode; they are simply unaccustomed to addressing human issues in their investigations of mathematics and science. They also seem unaccustomed to saying "I don't know" to a question raised by students who have seen the MIMI presentations. It is difficult for many teachers to move from the role of the "all-knowing" director of teaching activities to the role of collaborator with the students.

For many teachers, these materials offer a welcome relief to most materials available to them; many have chosen to base an entire curriculum year around the series, relating the materials to topics that were not initially anticipated.

As with anything new, it is important to consider what will be required for adoption in schools. The Bank Street team has now initiated a number of teacher training programs to encourage teachers to integrate the MIMI materials into their classrooms. It will be interesting over time to see just how these materials are used, and whether they will provide a template for how classrooms might work differently. Instead of being a great program that doesn't quite fit into standard classrooms (though adapted by many exceptional classrooms), it just might be the first of a class of programs that set new directives for the nature of thinking and learning.

Lessons Learned: Resources

The production of these materials was extremely expensive, relative to most educational materials. This resulted often in large uncertainties in terms of available funding extensions, as well as in the omission of intended developments.

This effort clearly required federal support, as it was too big and too risky for publishers to undertake. Also, issues of pricing and costs of bringing materials to market make the delivery of these materials over the long run quite uncertain; it is still a question, for example, if the second series on the Mayas will come to market.

Having watched this project develop over the last five years or so, I am impressed with Bank Street's perseverance in dealing directly with the financial implications and problems of this product. Very few organizations would commit the resources for fundraising that have been required for this venture, nor would they dare deal with the commercial worlds that are central to the eventual release and distribution of this product. And the fights are long from finished.

At some level, this is quite discouraging, for one would hope that high-quality materials would "sell themselves" and that there would be funding available for grand experiments such as this one. Yet the Voyage of the MIMI materials have been quite successful in spite of all these difficulties; perhaps they will lay the framework for other similar activities in the future.

Final Comments

There are a number of aspects of this project that, in my opinion, are noteworthy. As mentioned earlier, the development of materials relevant to students is extremely impressive. Whales and young scientists who are very human are very good entries into the field of science.

The portrayal of science as an activity, not as a set of facts, is also a critical contribution of this project. Complex scientific ideas have been taken from dull textbook accounts to direct human experiences and questions about the world. The integration of computers into this scientific enterprise is natural for this approach, thereby making clear to students how the very same devices they have in classrooms work as well for scientists in their endeavors.

The integration of the media is handled well in this project, with each class of media working well in its own right and playing a critical role in amplifying the effectiveness of other media. The use of the computers on board the ship in the drama make their use viable in the classroom, for example. Similarly, the shipwreck adventure makes accessible issues related to population biology shown in one of the computer modules. The use of the same actors in the dramatic and documentary series also enhances the unification of the materials, and the integration of the concepts by the students.

The print materials developed are central to the effective use of these materials in the classroom, as are the teacher training programs that have been initiated. The Bank Street team has acknowledged the importance of "standard materials" and "normal teachers" for integrating programs such as these into a wide range of American classrooms.

Finally, the impact of the dramatic episodes cannot be underestimated. These noninteractive, linear presentations demonstrate the power of television at its best—to motivate, to explore general topics, to "bring the world into the classroom." They make clear just how "standard media" have been used to serve particular purposes very well, and suggest that we keep all the advantages of each of these as we attempt to extend our media capabilities and develop our expertise as communicators.

Figure 1.

This software package involves students as "scientists" very naturally in measurement and data analysis activities; the computer serves as an analysis and presentation tool, while the various probes attached to the computer (for detecting light, sound, temperature, etc.) provide measurements of "real world phenomena".

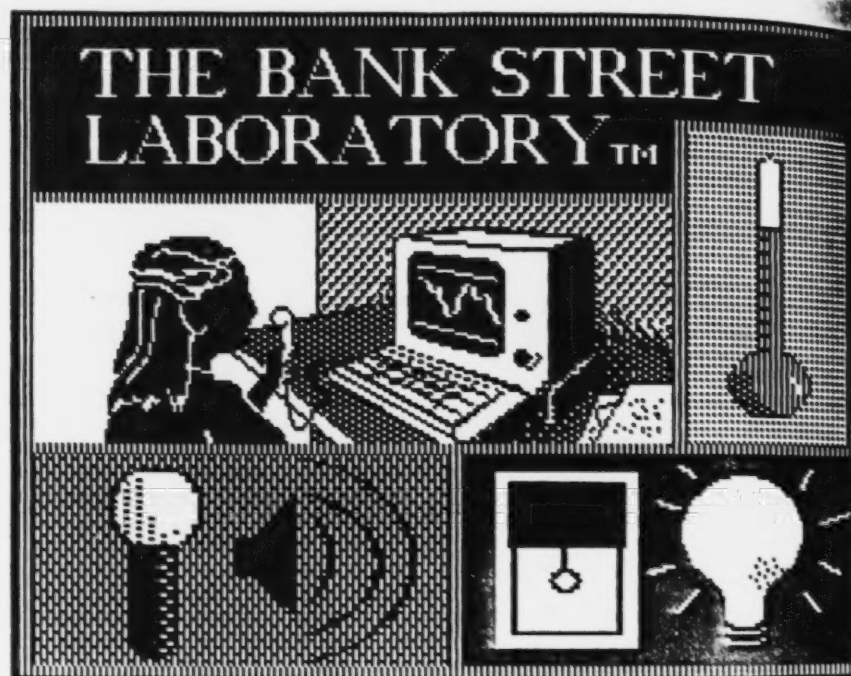


Figure 2.

This printout from the Bank Street Laboratory provides students with an analysis of a sound from their environment. "Seeing" the sound in this form while hearing it provides students with an understanding of the nature of sound typically unavailable to children of this age.

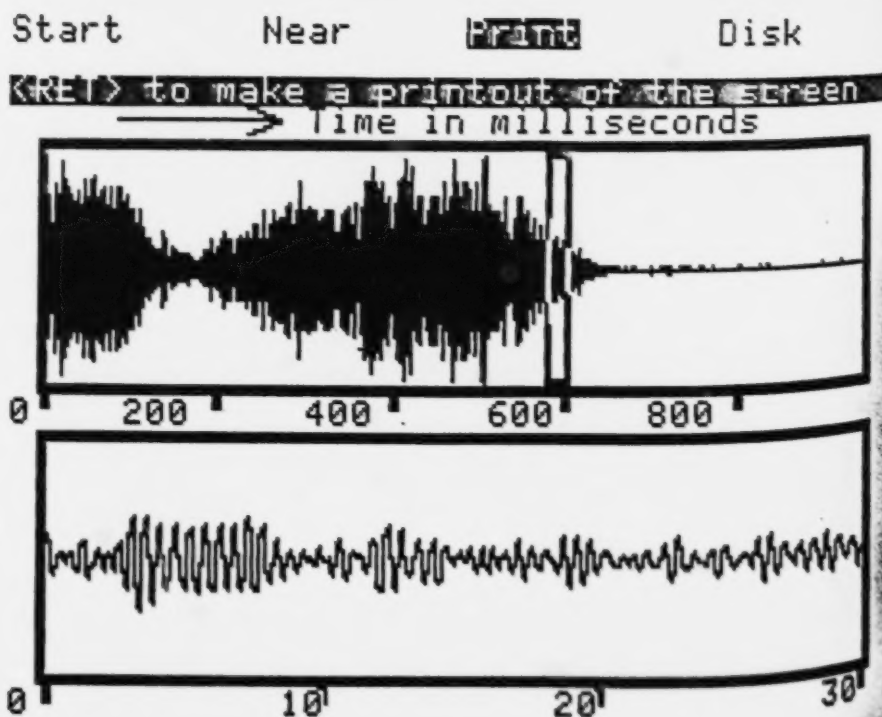


Figure 3.
In the context of a survival game, this software lets students work with an ecosystem model like the ones used by scientists; it lets them "see" how changes made in one population affect other populations in often unexpected ways.

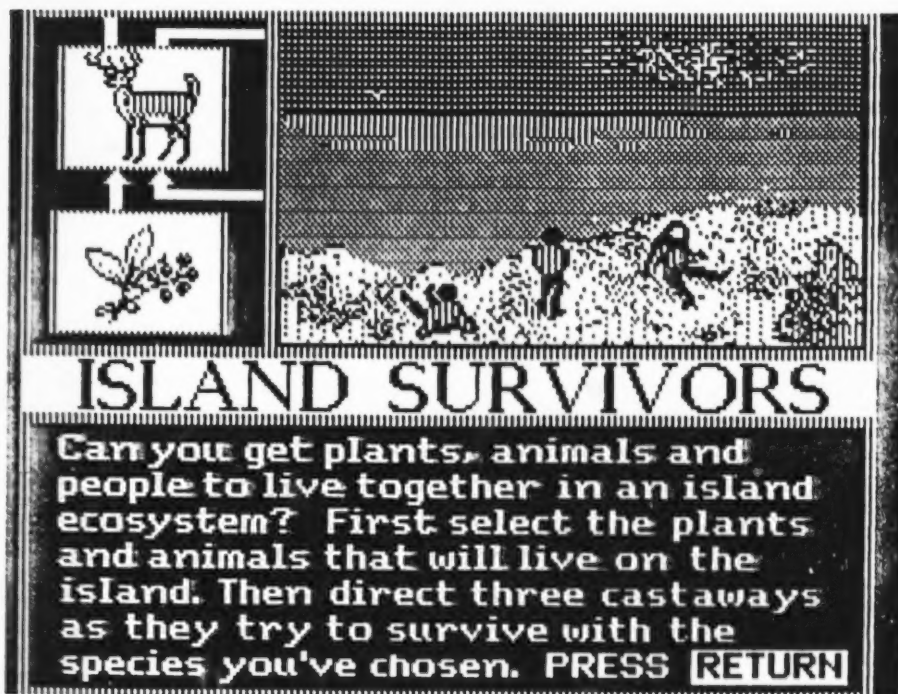
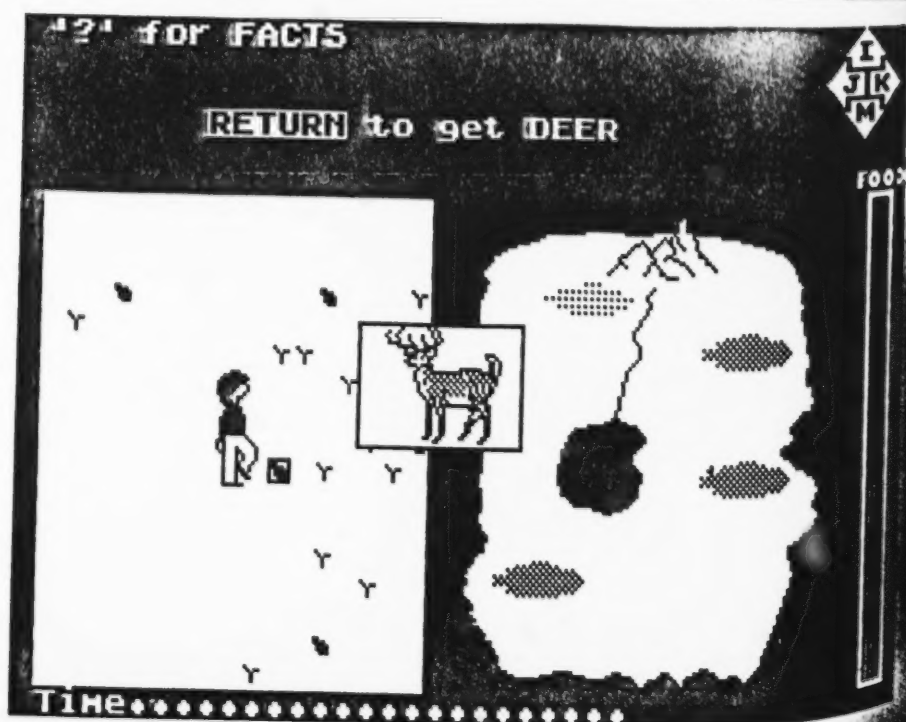


Figure 4.
 (a pair) Animations provide
 students with a feeling of
 "being there" on an island;
 map-views provide them with
 the tools for analyzing the
 impacts of their activities on
 the island ecosystem.



The centerpiece of the Voyage of the MIMI materials is a dramatic episode; it depicts a scientific whaling voyage and the adventures of its captain and youthful crew.







Samuel Y. Gibbon, Jr.

Samuel Y. Gibbon, Jr., is the executive director and executive producer of multimedia projects at the Bank Street College of Education in New York. Mr. Gibbon has extensive experience in television production for children, having been creative advisor at the Children's Television Workshop, and executive producer of projects at CTW, including "3-2-1-Contact" and "The Electric Company." In addition to teaching at the Harvard University Graduate School of Education, Mr. Gibbon has consulted for the Office of Technology Assessment of the U.S. Congress, SRI International, the National Science Foundation, and the Smithsonian Institution, among others. Mr. Gibbon earned his B.A. at Princeton University and was a Fulbright Fellow at London University.